

**UNITED STATES DISTRICT COURT  
WESTERN DISTRICT OF TEXAS  
WACO DIVISION**

Solas OLED Ltd., an Irish corporation,

*Plaintiff,*

vs.

LG Display Co., Ltd., a Korean corporation;  
LG Electronics, Inc., a Korean corporation;  
LG Display America, Inc., a California corporation;  
LG Electronics USA, Inc., a Delaware corporation;  
Sony Corporation, a Japanese corporation; and  
Sony Electronics, Inc., a Delaware corporation;

*Defendants.*

CASE NO. 6:19-cv-236-ADA

**Third Amended Complaint for  
Patent Infringement**

**JURY DEMANDED**

**Third Amended Complaint for Patent Infringement**

Plaintiff Solas OLED Ltd. (“Solas”) files this second amended complaint against Defendants LG Display Co., Ltd. (“LG Display”); LG Electronics, Inc. (“LG Electronics”); LG Display America, Inc. (“LG Display America”); LG Electronics USA, Inc. (“LG Electronics USA”); Sony Corporation (“Sony”); and Sony Electronics, Inc. (“Sony Electronics”) (collectively “Defendants”), alleging infringement of U.S. Patent Nos. 7,432,891; 7,573,068; and 7,907,137 (“Patents-in-Suit”).

**Plaintiff Solas OLED and the Patents-in-Suit.**

1. Plaintiff Solas is a technology licensing company organized under the laws of Ireland, with its headquarters at 4-5 Burton Hall Road, Sandyford, Dublin 18.

2. Solas is the owner of U.S. Patent No. 7,432,891, entitled “Active matrix drive circuit,” which issued October 7, 2008 (the “’891 patent”). A copy of the ’891 patent is attached to this complaint as Exhibit 1. Solas is the owner of U.S. Patent No. 7,573,068, entitled “Transistor array substrate and display panel,” which issued August 11, 2009 (the “’068 patent”). A copy of the ’068 patent is attached to this complaint as Exhibit 2. Solas is the owner of U.S. Patent No. 7,907,137, entitled “Display drive apparatus, display apparatus and drive control method thereof,” which issued March 15, 2011 (the “’137 patent”). A copy of the ’137 patent is attached to this complaint as Exhibit 3.

**Defendants and the Accused Products.**

3. Defendant LG Display Co., Ltd. (“LG Display”) is a Korean corporation. Defendant LG Electronics, Inc. (“LG Electronics”) is a Korean corporation. Defendant LG Display America, Inc. (“LG Display America”) is a California corporation and a wholly owned and controlled subsidiary of Defendant LG Display. Defendant LG Electronics USA, Inc. (“LG Electronics USA”) is a Delaware corporation and a wholly owned and controlled subsidiary of Defendant LG Electronics. Defendant Sony Corporation (“Sony”) is a Japanese Corporation. Defendant Sony Electronics Inc. (“Sony Electronics”) is a Delaware corporation and a wholly owned and controlled subsidiary of Defendant Sony.

4. The Accused Products are organic light-emitting diode (OLED) television displays and display panels, and televisions, monitors, mobile phones, and other products incorporating such OLED displays.

5. Defendants LG Display and LG Display America design, produce, and sell the accused OLED television displays and OLED display panels. Defendants LG Electronics and LG Electronics USA design, produce, and sell the accused televisions, monitors, mobile phones,

and other products incorporating LG OLED displays. Defendants Sony and Sony Electronics design, produce, and sell the accused televisions, monitors, mobile phones, and other products incorporating LG OLED displays (including the Bravia line of OLED televisions).



### **Jurisdiction, venue and joinder.**

6. Solas asserts claims for patent infringement against Defendants under the patent laws of the United States, including 35 U.S.C. §§ 271 and 281, *et seq.* The Court has original jurisdiction over Solas' patent infringement claims under 28 U.S.C. §§ 1331 and 1338(a).

7. The Court has personal jurisdiction over Defendants. Each Defendant has established minimum contacts with the United States as a whole such that the exercise of jurisdiction would not offend traditional notions of fair play and substantial justice. Defendants have purposefully directed activities at the United States—in particular, directing the accused OLED televisions, monitors, mobile phones, and other products for sale to distributors and end-customers within the United States (including within this District) and engaging in sales and marketing efforts to generate and support such sales. The claims for infringement arise out of, or relate to, those activities.

8. Defendants are jointly and severally liable for infringing the Patents-in-Suit. Defendants' liability arises out of the same transaction, occurrence, or series of transactions or occurrences. LG Display designs, produces, and sells accused OLED television displays and

display panels that are incorporated into accused OLED televisions, monitors, smart phones, and other products designed, produced, and sold by Defendants LG Electronics and Sony. As a result, this action involves questions of law and fact that are common to all Defendants (e.g., infringement by the accused OLED displays and accused OLED televisions incorporating those displays).

9. Venue is proper in this District. Venue is proper as to a foreign defendant in any district. 28 U.S.C. § 1391(c)(3); *In re HTC Corp.*, 889 F.3d 1349 (Fed. Cir. 2018). Defendants LG Display, LG Electronics, and Sony are foreign corporations. Defendants LG Display America, LG Electronics USA, and Sony Electronics are registered to do business and have transacted business in this District and have committed acts of direct and indirect infringement by, for example, making, using, offering to sell, selling, and importing products that infringe the Patents-in-Suit. Upon information and belief, Defendant LG Display America has regular and established places of businesses in this District, including at least its “Austin Representative Office” at 9600 Great Hills Trail, Suite 150W, Austin, TX 78759, U.S.A.<sup>1</sup> Upon information and belief, Defendant LG Electronics USA has regular and established places of businesses in this District, including at least at 9420 Research Blvd, Austin, Texas 78759; 4030 Braker Ln, Austin TX 78759; 4970 W Highway, 290 Austin, TX 78735; 1201 Barbara Jordan Blvd, Austin, TX 78723; 19000 Limestone Commercial Dr. Pflugerville, TX 78660; 3201 South Interstate 35 Round Rock, TX 78664; 9607 Research Blvd Austin, TX 78759; and 11066 Pecan Park Blvd Cedar Park, TX 78613. Upon information and belief, Defendant Sony Electronics has regular and established places of businesses in this District, including at least at 11501 Century Oaks Ter Austin, TX, 78758; 9600 Great Hills Trail Austin, TX 78701; 4970 W Highway, 290 Austin, TX

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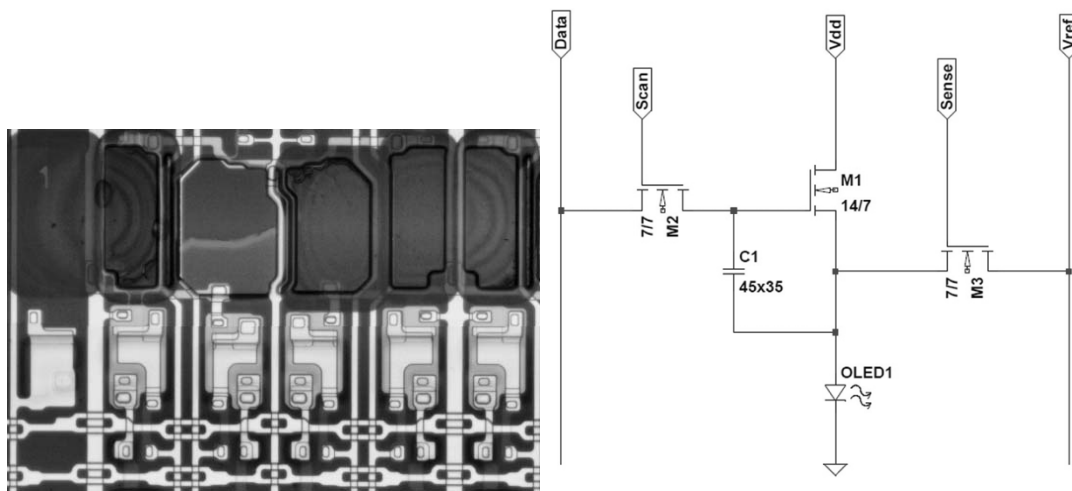
<sup>1</sup> See, e.g., <http://www.lgdisplay.com/eng/company/locationGlobal?placeLocCode=OVE02>.

78735; 1201 Barbara Jordan Blvd, Austin, TX 78723; 19000 Limestone Commercial Dr. Pflugerville, TX 78660; 3201 South Interstate 35 Round Rock, TX 78664; 9607 Research Blvd Austin, TX 78759; and 11066 Pecan Park Blvd Cedar Park, TX 78613.

**The accused features and functionality.**

10. The accused features relate to the driving circuitry for pixels of the accused OLED displays—in particular, the compensation functionality and associated circuitry for measuring and compensating for changes in driving transistor characteristics (e.g., changes in transistor electron mobility).

11. The following image and circuit diagram illustrate the pixel layout and pixel-driving circuitry for an example accused OLED display.



12. The driving current for light-emitting diode (OLED1) flows through Vdd and driving transistor M1. The accused functionality and circuitry relate to measuring the OLED driving current via the Vref line and supplying a voltage to the Data line to compensate for differences in driving transistor characteristics (e.g., manufacturing-related differences in the electron mobility of driving transistor M1). One important benefit of this infringing functionality is providing consistent display luminance.

**Count 1 - Claim for patent infringement of the '891 patent.**

13. The foregoing paragraphs are incorporated by reference as if fully set forth herein.

14. On October 7, 2008, the United States Patent and Trademark Office issued U.S. Patent No. 7,432,891, entitled "Active matrix drive circuit." Ex. 1.

15. Solas is the owner of the '891 patent with full rights to pursue recovery of royalties and other remedies for infringement, including full rights to recover past and future damages.

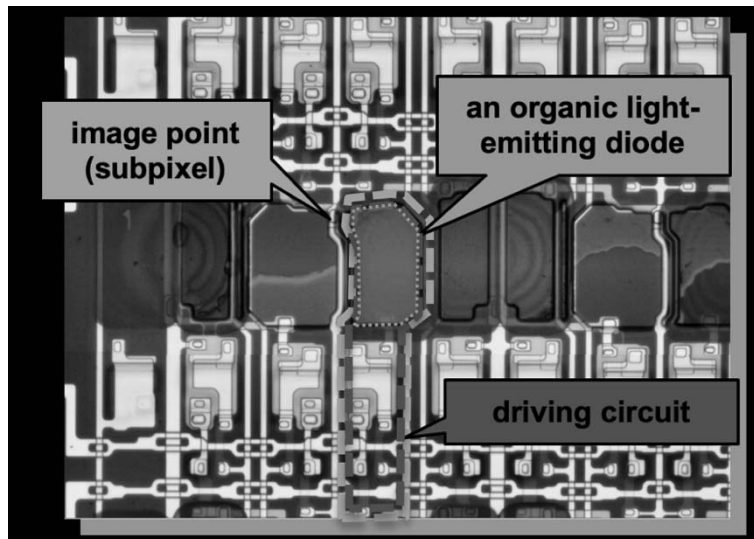
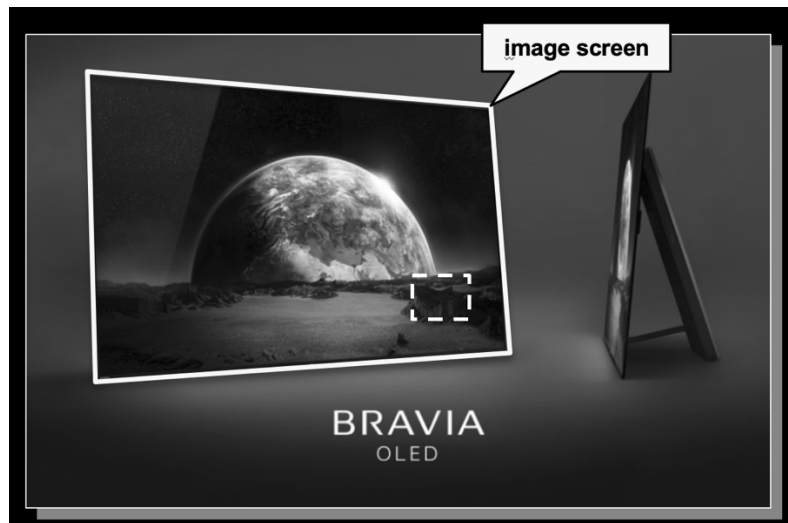
16. Each claim of the '891 patent is valid, enforceable, and patent-eligible.

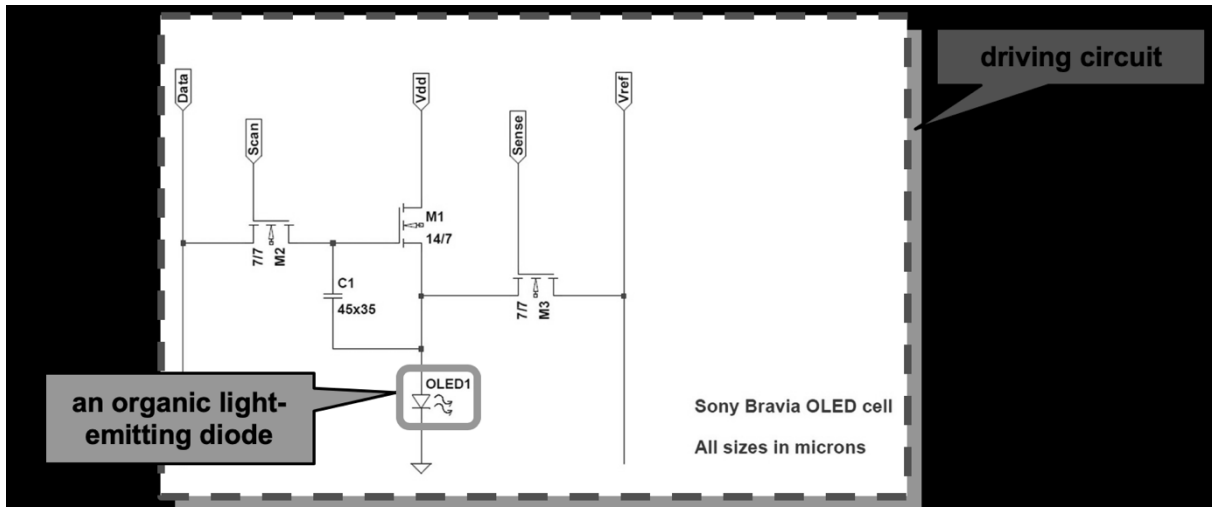
17. Within the United States, each Defendant has offered for sale, sold, and used, accused products that infringe the '891 patent (i.e., that meet each element of at least one claim, both literally and equivalently) and continues to do so, for example, OLED television displays and display panels, and televisions, monitors, mobile phones, and other products incorporating such OLED displays, such as the Sony Bravia 55A1 OLED Television (KD-55A1) and the LG OLED55B7A OLED Television (OLED55B7A-U), that infringe the claims of the '891 patent. Each Defendant has additionally imported such infringing products into the United States and continues to do so.

18. By way of example only, the Sony Bravia 55A1 OLED Television infringes an exemplary claim of the '891 patent, as in the following description, which Solas provides without the benefit of information about the accused device obtained through discovery. For example, claim 1 claims a driving circuit as follows:

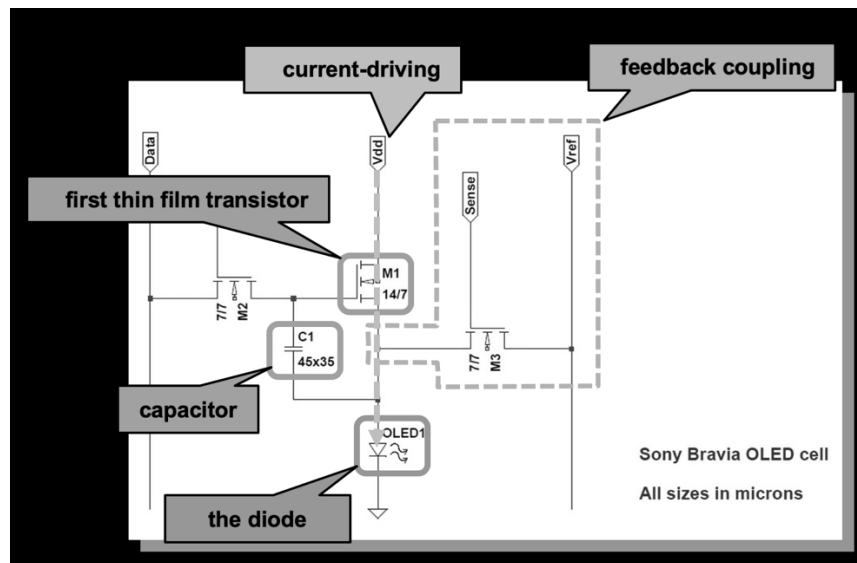
a. *A driving circuit for an image point of an image screen which has an organic light-emitting diode.* For example, the Sony Bravia 55A1 OLED Television has

a driving circuit for an image point of an image screen having an organic light-emitting diode, as shown below.





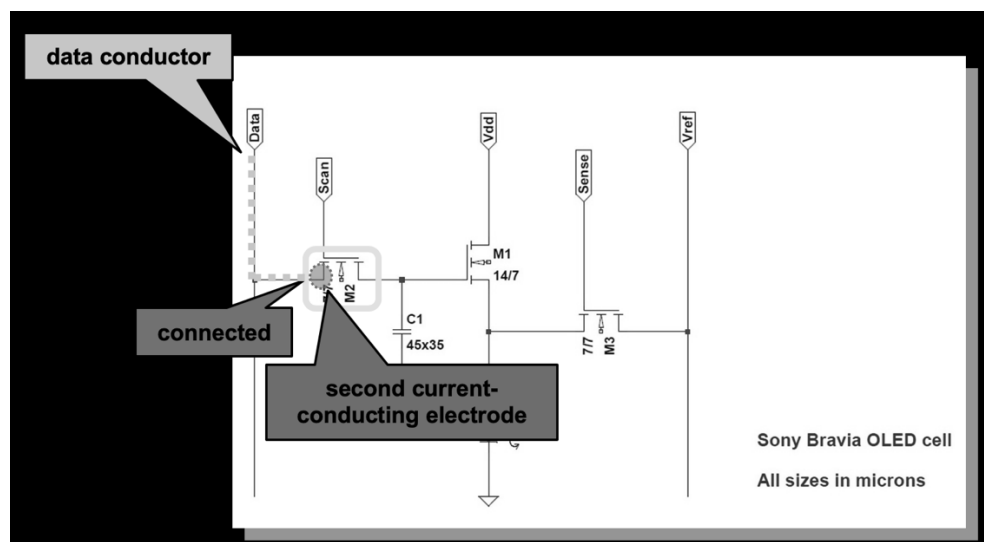
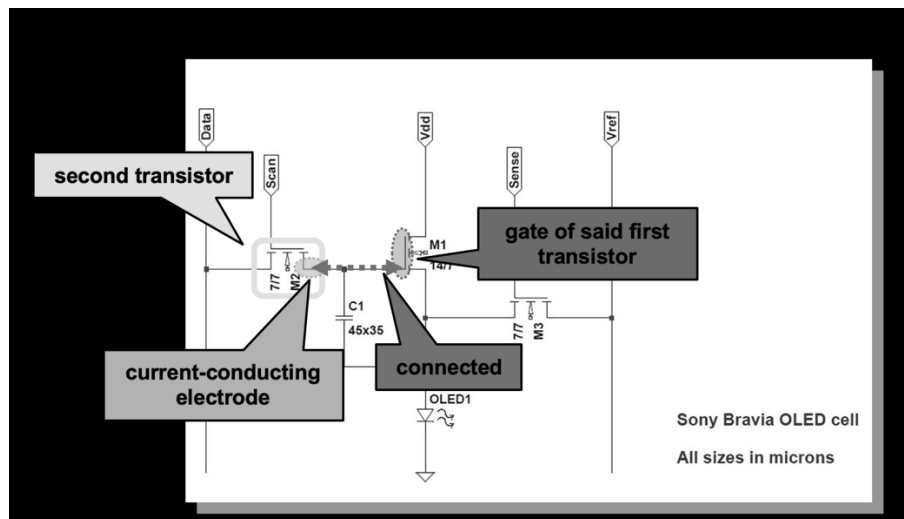
b. *comprising a capacitor; a feedback coupling; a first thin film transistor as a current-driving transistor for the diode.* For example, the driving circuits of the Sony Bravia 55A1 OLED Television have a capacitor, a feedback coupling, and a first thin film transistor as a current-driving transistor for the diode, as shown below.

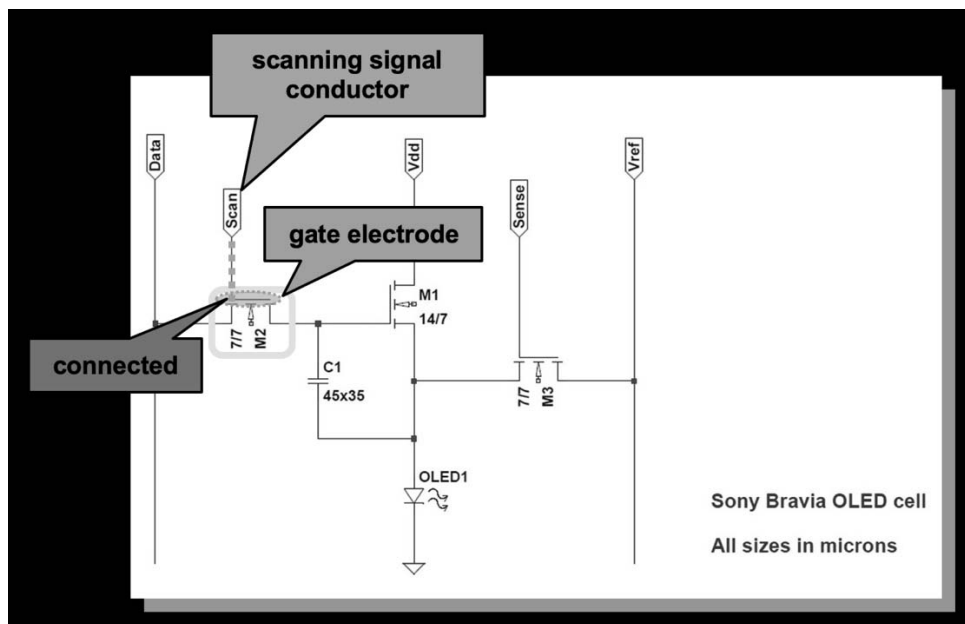


c. *a second transistor which is connected by a current-conducting electrode with a gate of said first transistor and by a second current-conducting electrode with a data conductor and by its gate electrode with a scanning signal conductor.* For example, the driving circuits of the Sony Bravia 55A1 OLED Television also have a second

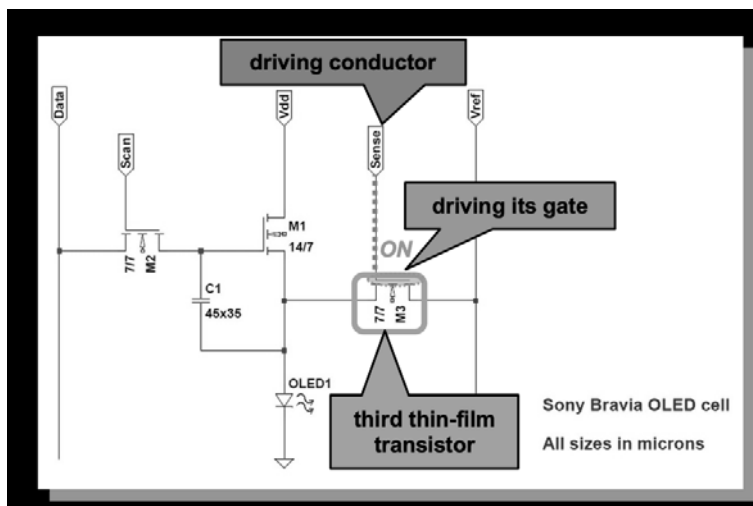


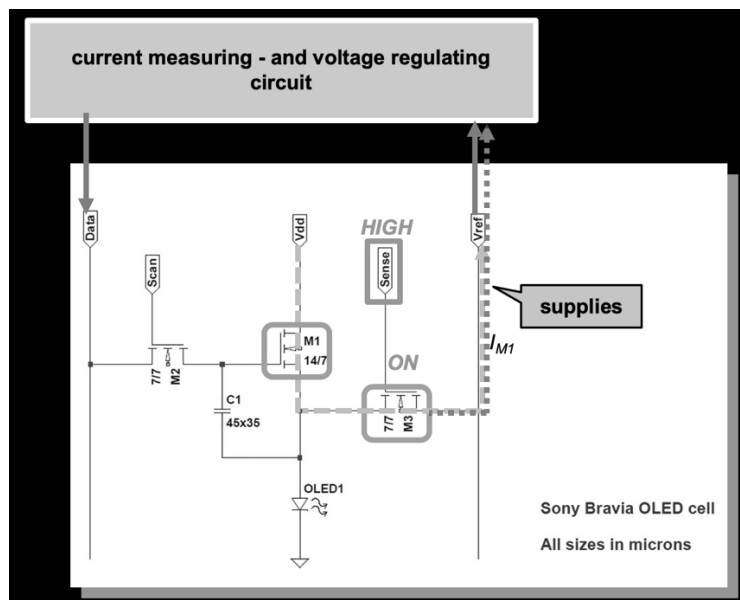
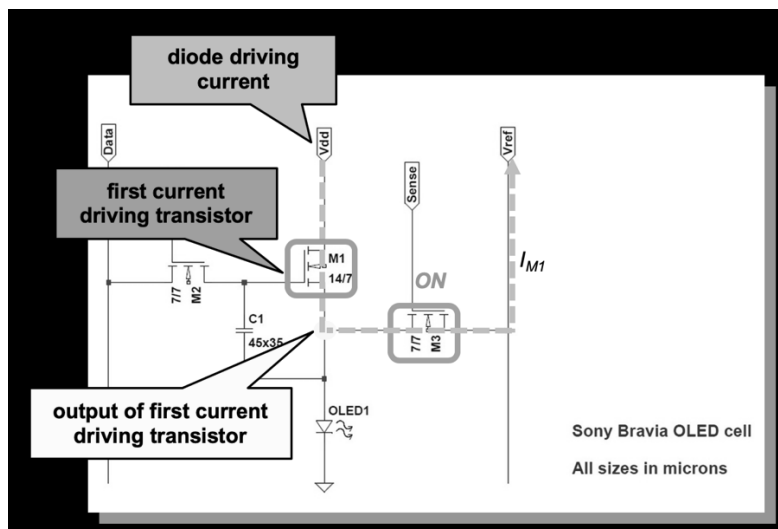
transistor that is connected with a gate of the first transistor by a current-conducting electrode, and the second transistor is connected with a data conductor by a second current-conducting electrode, and the second transistor is connected with a scanning signal conductor by its gate electrode, as shown below.



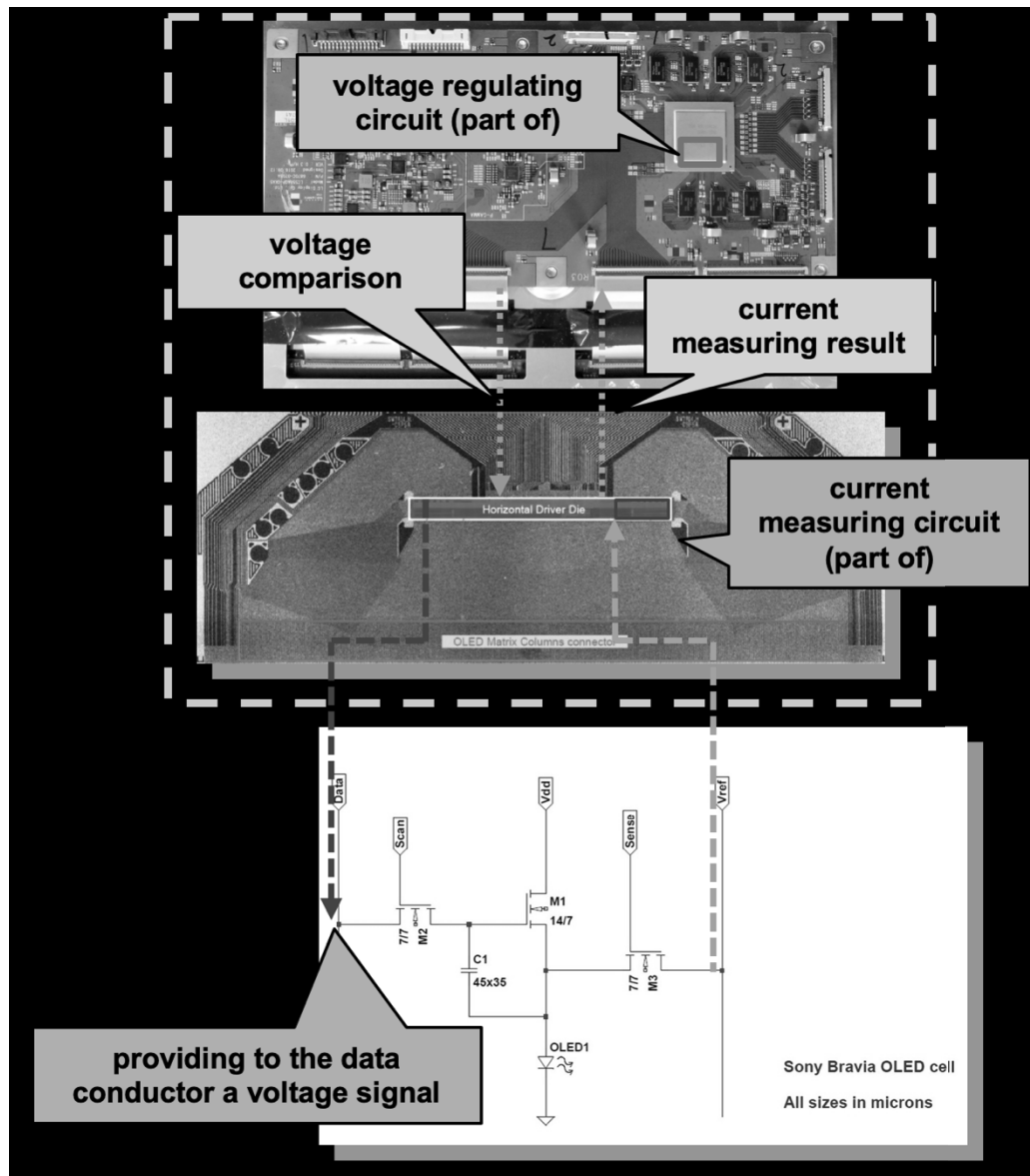


d. *a third thin film transistor which during driving its gate through a driving conductor taps a diode driving current at an output of said first current-driving transistor and supplies a current measuring- and voltage regulating circuit.* For example, the driving circuits of the Sony Bravia 55A1 OLED Television also have a third thin film transistor that, during driving its gate through a driving conductor, taps a diode driving current at an output of the first current-driving transistor and supplies a current measuring and voltage regulating circuit, as shown below.

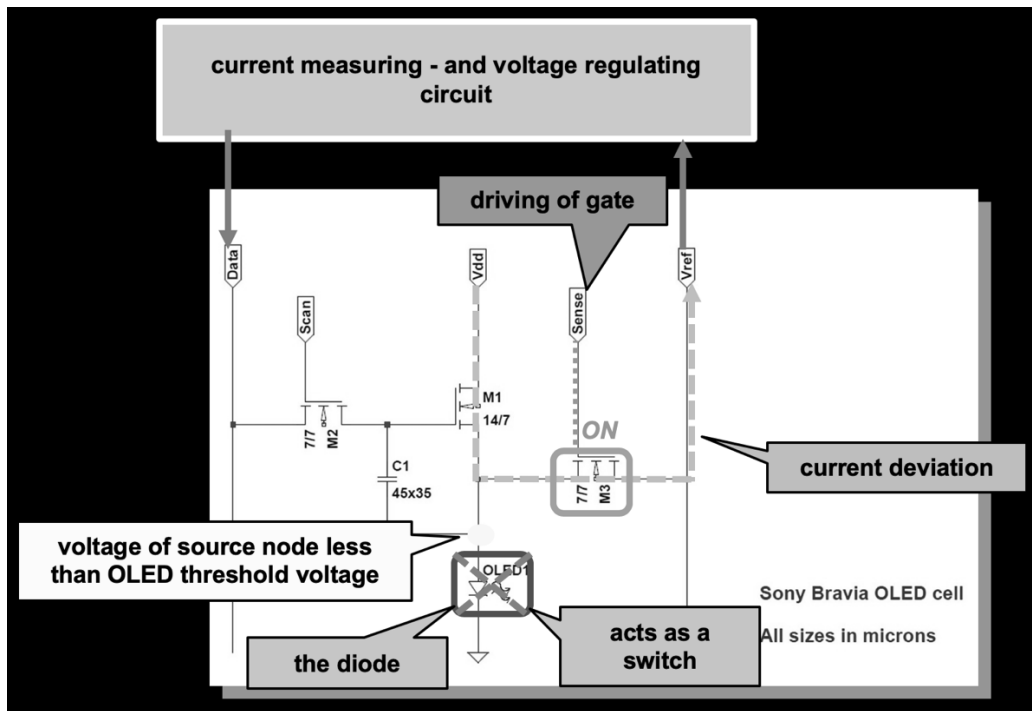








f. so that the diode during driving of said gate of said third transistor due to its non-linear switching characteristic acts as a switch for a current deviation in said current measuring- and voltage regulating circuit. For example, in the Sony Bravia 55A1 OLED Television, the diode, during driving of the third transistor's gate, due to its non-linear switching characteristic, acts as a switch for a current deviation in the current measuring and voltage regulating circuit, as shown below.



19. The '891 patent claims priority to German patent DE10254511A (“Active matrix drive circuit”) (issued as DE10254511B4) (“DE '511”) under 35 U.S.C. Section 119(a) (allowing a claim of US priority, under certain conditions, for “an application for a patent for the same invention in a foreign country”). The DE '511 family is well known in the international display industry and has been cited in at least 50 patents or applications.

20. Defendants LG Display and LG Display America have known of the '891 patent, or has been willfully blind to the '891 patent, since at least 2005. LG Display or its predecessors have cited to DE '511 (including the application and the patent), or foreign counterparts in the following LG Display patents:

- KR100768047B1 (filed 11/30/2005 by LG.Philips LCD Co., Ltd., predecessor to LG Display) (“OLED display apparatus and drive method thereof”) (citing DE10254511B4);

- KR101200884B1 (filed 6/14/2006 by LG Display Co., Ltd.) (“Light emitting diode and light emitting display device and method for driving the same”) (citing KR100580956B1, Korean counterpart to DE10254511). In fact, the only patent cited on the face of the identified LG Display patent is the Korean counterpart to DE ‘511;
- KR101390316B1 (filed 10/30/2007 by LG Display Co., Ltd.) (“AMOLED and driving method thereof”) (citing KR20040045352A, Korean counterpart to DE10254511);
- KR101597037B1 (filed 6/26/2014 by LG Display Co., Ltd.) (“Organic light emitting display for compensating electrical characteristics deviation of driving element”) (citing DE10254511B4).

21. Defendants LG Display and LG Display America have known how the Accused Products operate and have known, or have been willfully blind to the fact, that using, offering to sell, and selling the Accused Products within the United States, or importing the Accused Products into the United States, would constitute infringement.

22. Defendants LG Electronics and LG Electronics USA have known of the ’891 patent, or have been willfully blind to the ’891 patent, since at least 2005. LG Electronics has learned of the ’891 patent through its investment in, and work with, related company LG Display. LG Electronics’ and LG Display’s engineers and product development employees work together with LG legal staff and outside counsel in the process of preparing and prosecuting patent applications. Through this process, these employees became aware of and/or were willfully blind to the ’891 patent and to its relevance to the products that they design for LG Electronics and LG Display.

23. Defendants LG Electronics and LG Electronics USA have further known how the Accused Products operate and have known, or have been willfully blind to the fact, that using, offering to sell, and selling the Accused Products within the United States, or importing the Accused Products into the United States, would constitute infringement.

24. Defendants Sony Corporation and Sony Electronics have known of the '891 patent, or have been willfully blind to the '891 patent, since at least 2009. Sony cited to DE '511 on the face of the following patent: JP5278119B2 (filed 4/2/2009 by Sony Corporation) ("Method of driving a display device") (citing DE10254511A). Sony's engineers and product development employees work together with Sony legal staff and outside counsel in the process of preparing and prosecuting patent applications. Through this process, these employees became aware of and/or were willfully blind to the '891 patent and to its relevance to the products that they design for Sony.

25. Defendants Sony and Sony Electronics have further known how the Accused Products operate and has known, or have been willfully blind to the fact, that using, offering to sell, and selling the Accused Products within the United States, or importing the Accused Products into the United States, would constitute infringement.

26. Defendants have induced, and continue to induce, infringement of the '891 patent by actively encouraging others (including distributors and end customers) to use, offer to sell, or sell the Accused Products within the United States or to import the Accused Products into the United States. On information and belief, these acts include: providing information and instructions on the use of the Accused Products; providing information, education and instructions supporting sales by United States distributors; providing the Accused Products to United States distributors; indemnifying patent infringement within the United States; and



sending representatives to the United States to demonstrate, market and sell the Accused Products.

27. Defendants have contributed to infringement of the claims of the '891 patent and continue to do so by supplying, or causing to be supplied, material parts of the invention within the United States—in particular, the circuitry designed specifically for performing the compensation functionality described in ¶¶ 10-12 and 18, including circuitry for measuring the driving current, conducting a voltage comparison, and providing a compensating voltage signal. These components have no substantial non-infringing uses (i.e., substantial uses other than the accused compensation functionality) and are known by Defendants to be especially adapted for use in infringing the '891 patent by implementing the claimed compensation functionality. For example, upon information and belief, the image screen (e.g., the OLED display panel) of the Sony Bravia 55A1 OLED Television was supplied by Defendant LG Display and/or Defendant LG Electronics.

28. Defendants' infringement of the '891 patent has been, and continues to be, willful and egregious.

29. Solas has been damaged by Defendants' infringement and is entitled to reasonable royalty damages and enhanced damages due to Defendants' willful infringement.

**Count 2 - Claim for patent infringement of the '068 patent.**

30. The foregoing paragraphs are incorporated by reference as if fully set forth herein.

31. On August 11, 2009, the United States Patent and Trademark Office issued U.S. Patent No. 7,573,068, entitled "Transistor array substrate and display panel." Ex. 2.

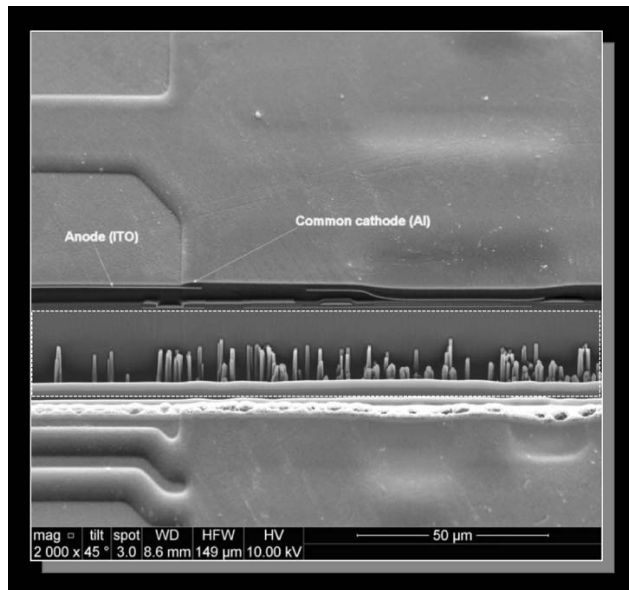
32. Solas is the owner of the '068 patent with full rights to pursue recovery of royalties and other remedies for infringement, including full rights to recover past and future damages.

33. Each claim of the '068 patent is valid, enforceable, and patent-eligible.

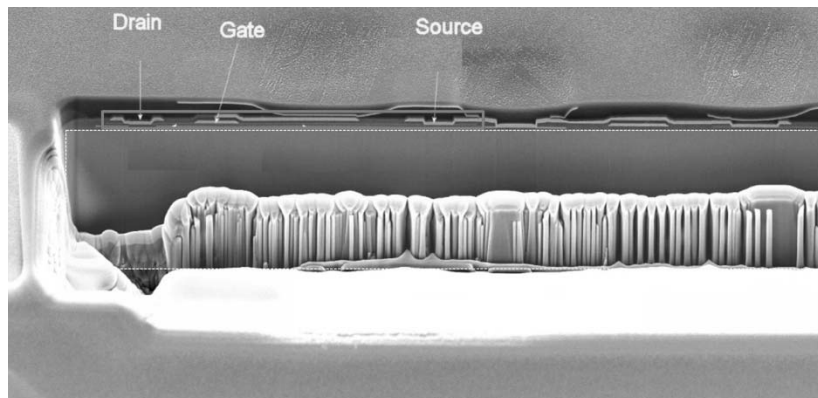
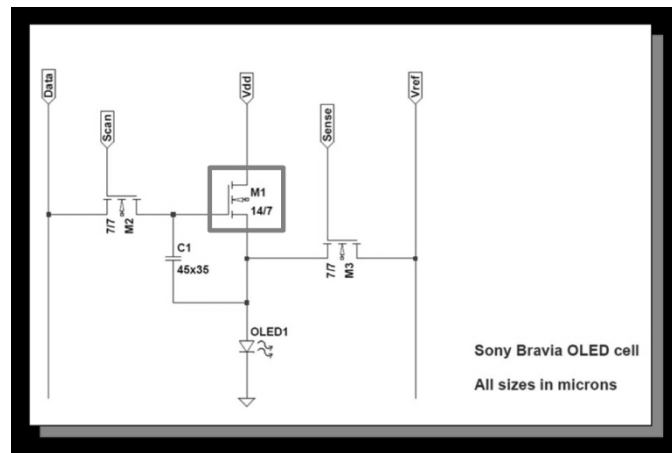
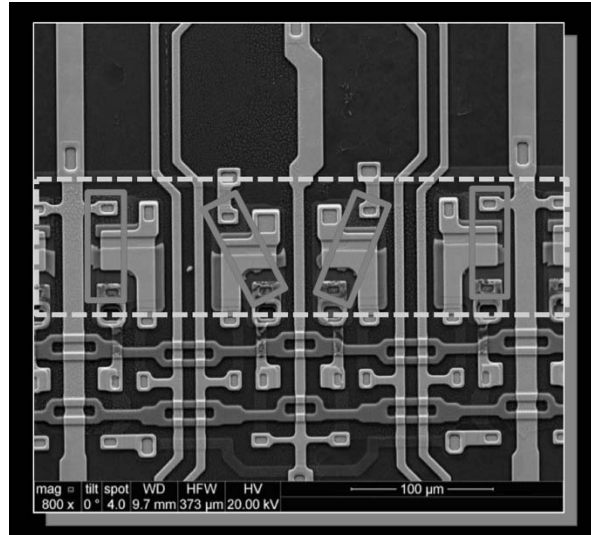
34. Within the United States, each Defendant has offered for sale, sold, and used, accused products that infringe the '068 patent (i.e., that meet each element of at least one claim, both literally and equivalently) and continues to do so, for example, OLED television displays and display panels, and televisions, monitors, mobile phones, and other products incorporating such OLED displays, such as the Sony Bravia 55A1 OLED Television (KD-55A1), the LG OLED55B7A OLED Television (OLED55B7A-U), the Sony Trimaster EL PVM-A250 OLED Monitor, and the Sony Electronic Viewfinder FDA-EV1MK, that infringe the claims of the '068 patent. Each Defendant has additionally imported such infringing products into the United States and continues to do so.

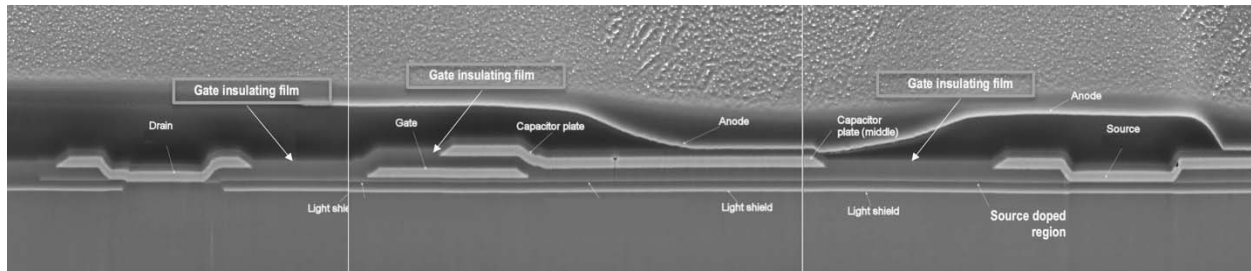
35. By way of example only, the Sony Bravia 55A1 OLED Television infringes an exemplary claim of the '068 patent, as in the following description, which Solas provides without the benefit of information about the accused device obtained through discovery. For example, claim 13 claims a display panel as follows:

a. *A display panel comprising: a substrate.* For example, the Sony Bravia 55A1 OLED Television has a display panel comprising a substrate, as shown below.

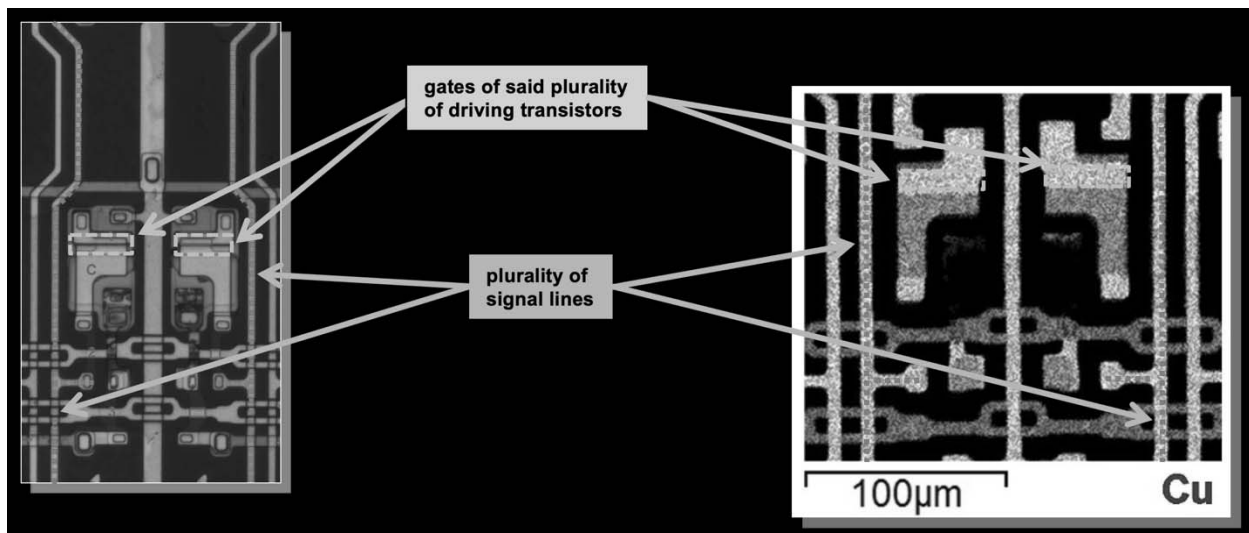


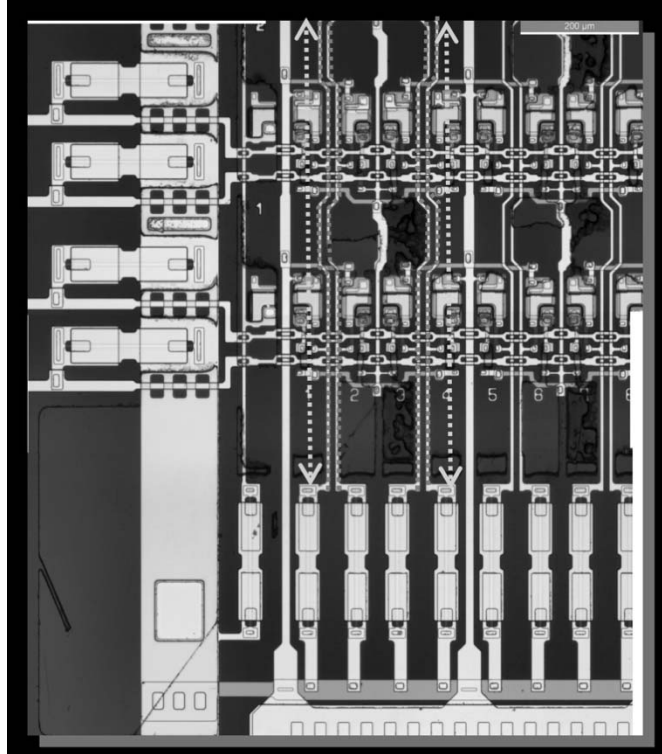
b. *a plurality of driving transistors which are arrayed in a matrix on the substrate, each of the driving transistors having a gate, a source, a drain, and a gate insulating film inserted between the gate, and the source and drain.* For example, the display panel of the Sony Bravia 55A1 OLED Television comprises a plurality of driving transistor arrayed in a matrix on the substrate, each having a gate, a source, a drain, and a gate insulating film between the gate, and the source and drain, as shown below.



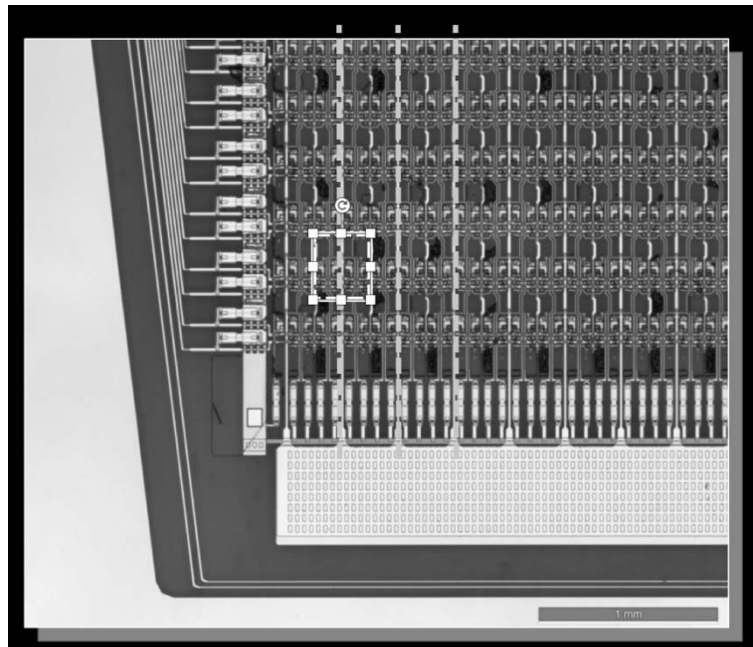
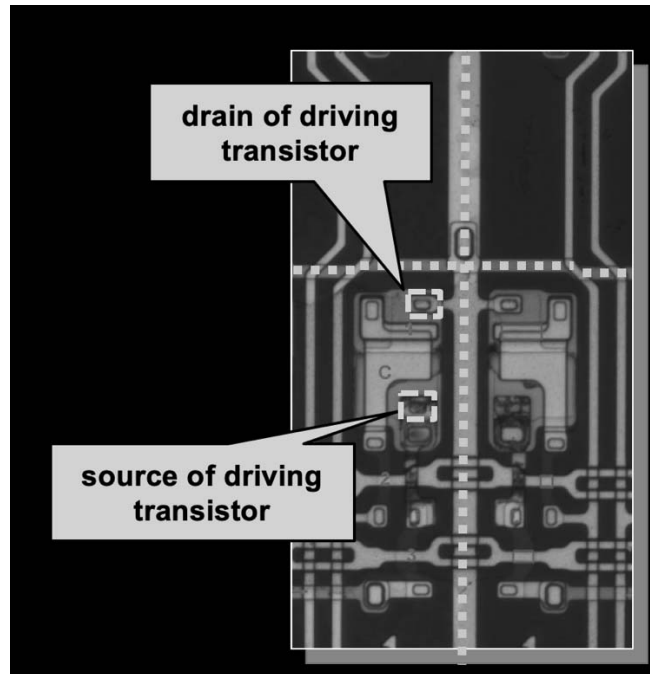


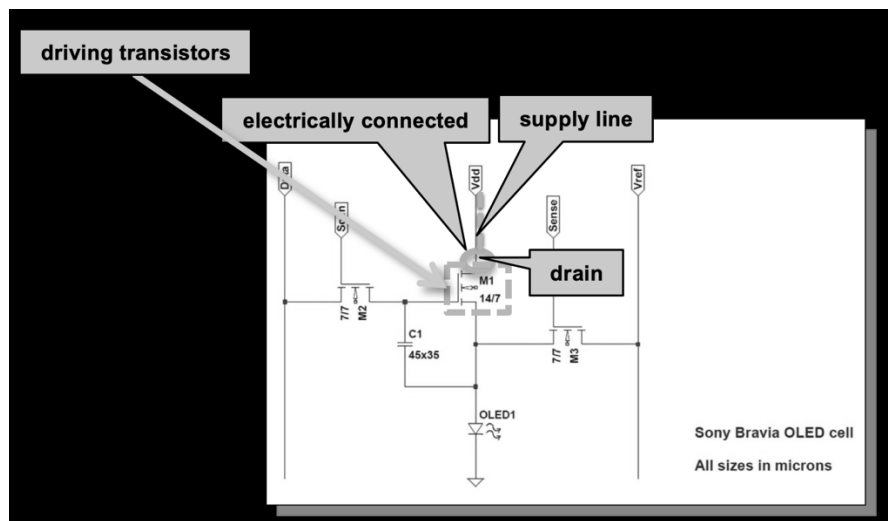
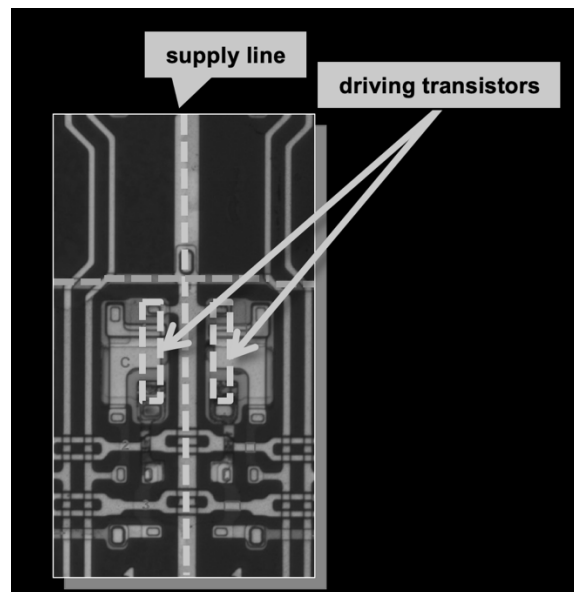
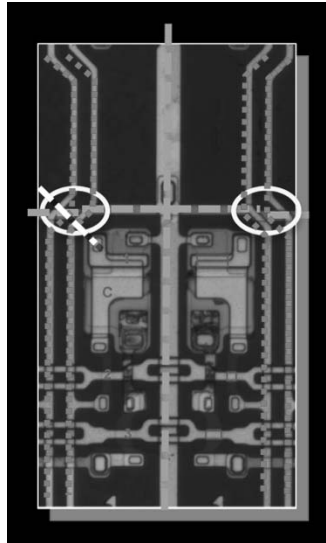
c. *a plurality of signal lines which are patterned together with the gates of said plurality of driving transistors and arrayed to run in a predetermined direction on the substrate.* For example, the display panel of the Sony Bravia 55A1 OLED Television comprises a plurality of signal lines that are patterned together with the gates of the driving transistors and arrayed to run in a predetermined direction on the substrate, as shown below.





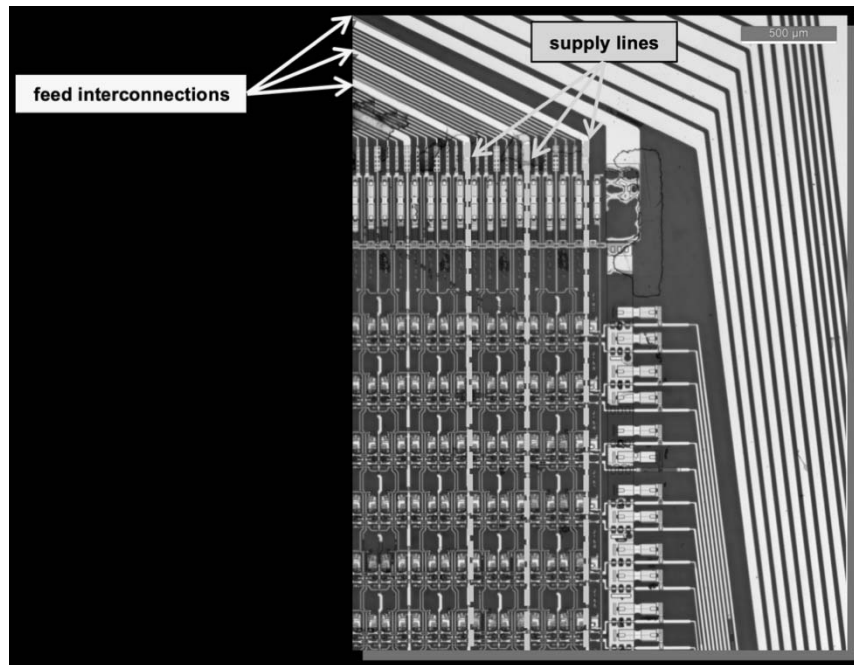
d. *a plurality of supply lines which are patterned together with the sources and drains of said plurality of driving transistors and arrayed to cross said plurality of signal lines via the gate insulating film, one of the source and the drain of each of driving transistors being electrically connected to one of the supply lines.* For example, the display panel of the Sony Bravia 55A1 OLED Television comprises a plurality of supply lines that are patterned together with the sources and drains of the driving transistors and arrayed to cross the signal lines via the gate insulating film, where one of the source and the drain of the driving transistors are electrically connected to one of the supply lines, as shown below.



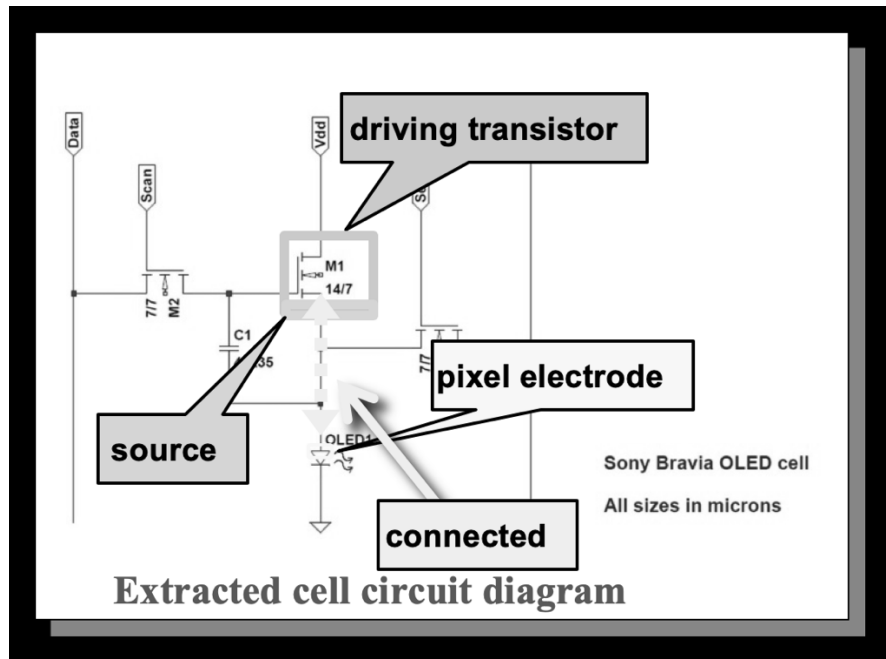
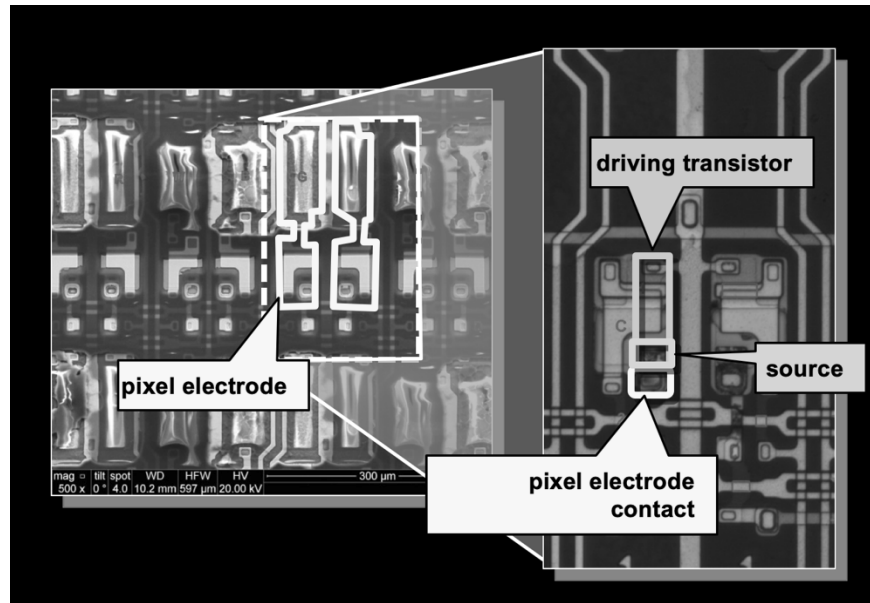




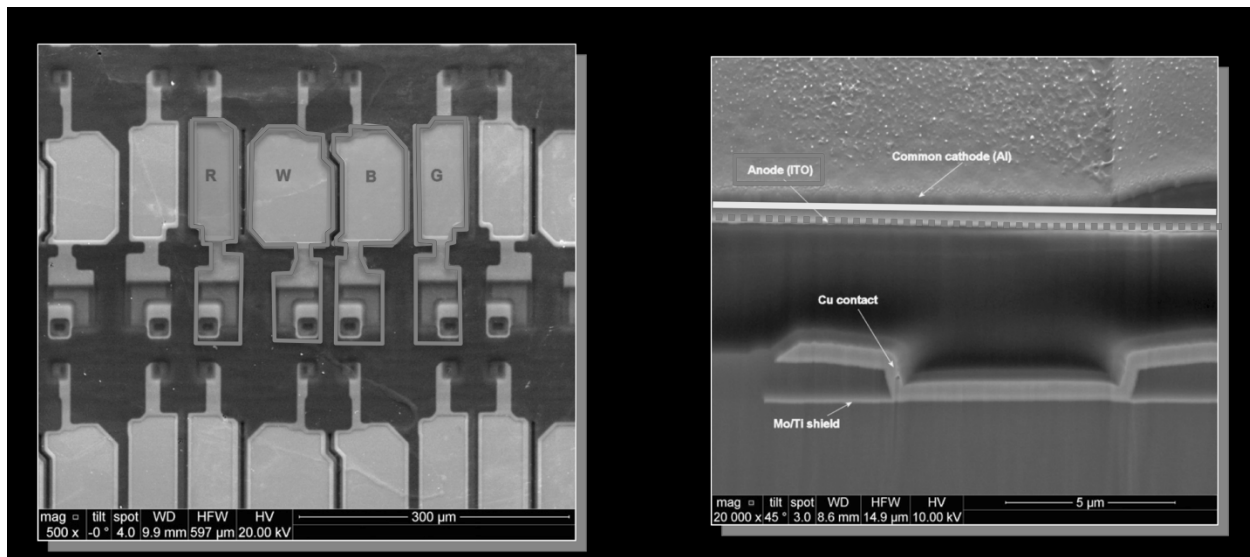
e. *a plurality of feed interconnections which are connected to said plurality of supply lines along said plurality of supply lines.* For example, the display panel of the Sony Bravia 55A1 OLED Television comprises a plurality of feed interconnections which are connected to the supply lines along the supply lines, as shown below.



f. *a plurality of pixel electrodes each of which is electrically connected to the other of the source and the drain of a corresponding one of said plurality of driving transistors.* For example, the display panel of the Sony Bravia 55A1 OLED Television comprises a plurality of pixel electrodes that are electrically connected to the other of the source and the drain of corresponding driving transistors, as shown below.

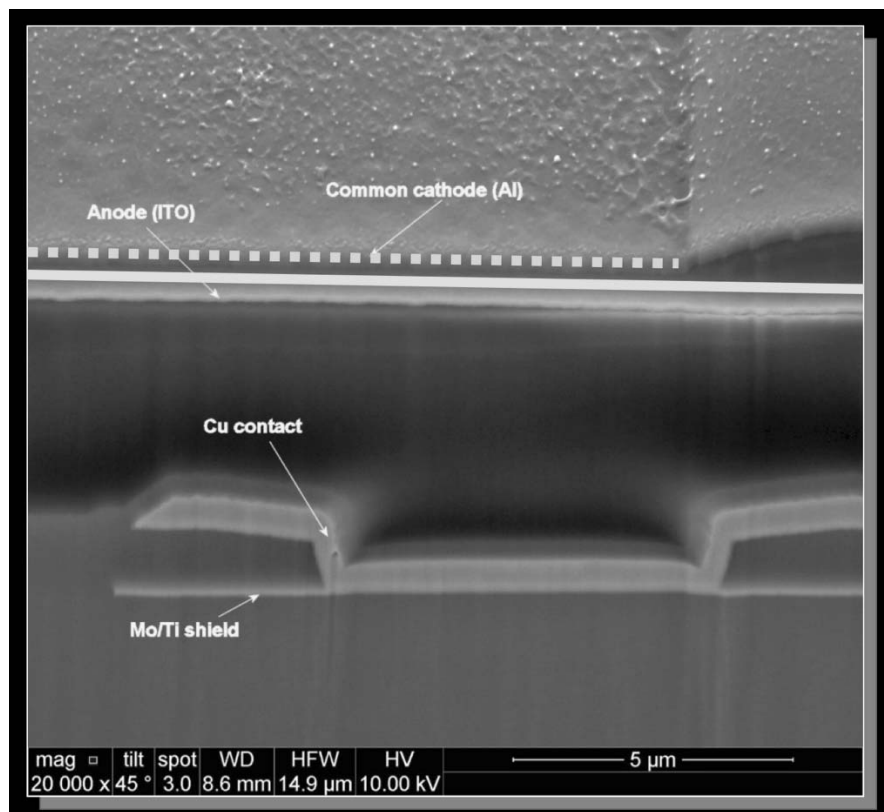


g. a plurality of light-emitting layers which are formed on said plurality of pixel electrodes, respectively. For example, the display panel of the Sony Bravia 55A1 OLED Television comprises a plurality of light-emitting layers that are formed on the pixel electrodes respectively, as shown below.



h. *a counter electrode which covers said plurality of light-emitting layers.*

For example, the display panel of the Sony Bravia 55A1 OLED Television comprises a counter electrode that covers the light-emitting layers, as shown below.



36. Defendants Sony Corporation and Sony Electronics have known of the '068 patent, or have been willfully blind to the '068 patent, since at least 2014. Sony cited to '068 patent on the face of the following patent: US10,103,212B2 (filed 7/16/2014 by Sony Corporation) ("Display device, method of manufacturing the same, and electronic apparatus") (citing US2006/0098521A1, publication of application for '068 patent). Sony's engineers and product development employees work together with Sony legal staff and outside counsel in the process of preparing and prosecuting patent applications. Through this process, these employees became aware of and/or were willfully blind to the '068 patent and to its relevance to the products that they design for Sony.

37. Defendants Sony and Sony Electronics have further known how the Accused Products operate and have known, or have been willfully blind to the fact, that using, offering to sell, and selling the Accused Products within the United States, or importing the Accused Products into the United States, would constitute infringement.

38. Defendants LG Display and LG Display America have known of the '068 patent, or have been willfully blind to the '068 patent, since at least 2014. LG Display has learned of the '068 patent through its work with and development of OLED display panels for Sony.

39. Defendants LG Display and LG Display America have known how the Accused Products operate and have known, or have been willfully blind to the fact, that using, offering to sell, and selling the Accused Products within the United States, or importing the Accused Products into the United States, would constitute infringement.

40. Defendants LG Electronics and LG Electronics USA have known of the '068 patent, or has been willfully blind to the '068 patent, since at least 2014. LG Electronics has learned of the '068 patent through its investment in, and work with, related company LG

Display. LG Electronics' and LG Display's engineers and product development employees work together with LG legal staff and outside counsel in the process of preparing and prosecuting patent applications. Through this process, these employees became aware of and/or were willfully blind to the '068 patent and to its relevance to the products that they design for LG Electronics and LG Display.

41. Defendants LG Electronics and LG Electronics USA have further known how the Accused Products operate and have known, or have been willfully blind to the fact, that using, offering to sell, and selling the Accused Products within the United States, or importing the Accused Products into the United States, would constitute infringement.

42. Defendants have induced, and continue to induce, infringement of the '068 patent by actively encouraging others (including distributors and end customers) to use, offer to sell, or sell the Accused Products within the United States or to import the Accused Products into the United States. On information and belief, these acts include: providing information and instructions on the use of the Accused Products; providing information, education and instructions supporting sales by United States distributors; providing the Accused Products to United States distributors; indemnifying patent infringement within the United States; and sending representatives to the United States to demonstrate, market and sell the Accused Products.

43. Defendants have contributed to infringement of the claims of the '068 patent and continue to do so by supplying, or causing to be supplied, material parts of the invention within the United States—in particular, the display panel having the components and structure described in ¶ 35. These components have no substantial non-infringing uses (i.e., substantial uses other than the accused compensation functionality) and are known by Defendants to be

especially adapted for use in infringing the '068 patent by implementing the claimed structure. For example, upon information and belief, the image screen (e.g., the OLED display panel) of the Sony Bravia 55A1 OLED Television was supplied by Defendant LG Display and/or Defendant LG Electronics.

44. Defendants' infringement of the '068 patent has been, and continues to be, willful and egregious.

45. Solas has been damaged by Defendants' infringement and is entitled to reasonable royalty damages and enhanced damages due to Defendants' willful infringement.

**Count 3 - Claim for patent infringement of the '137 patent.**

46. The foregoing paragraphs are incorporated by reference as if fully set forth herein.

47. On March 15, 2011, the United States Patent and Trademark Office issued U.S. Patent No. 7,907,137, entitled "Display drive apparatus, display apparatus and drive control method thereof." Ex. 3.

48. Solas is the owner of the '137 patent with full rights to pursue recovery of royalties and other remedies for infringement, including full rights to recover past and future damages.

49. Each claim of the '137 patent is valid, enforceable, and patent-eligible.

50. Within the United States, each Defendant has offered for sale, sold, and used, accused products that infringe the '137 patent (i.e., that meet each element of at least one claim, both literally and equivalently) and continues to do so, for example, OLED television displays and display panels, and televisions, monitors, mobile phones, and other products incorporating such OLED displays, such as the Sony Bravia 55A1 OLED Television (KD-55A1) and the LG OLED55B7A OLED Television (OLED55B7A-U), that infringe the claims of the '137 patent.

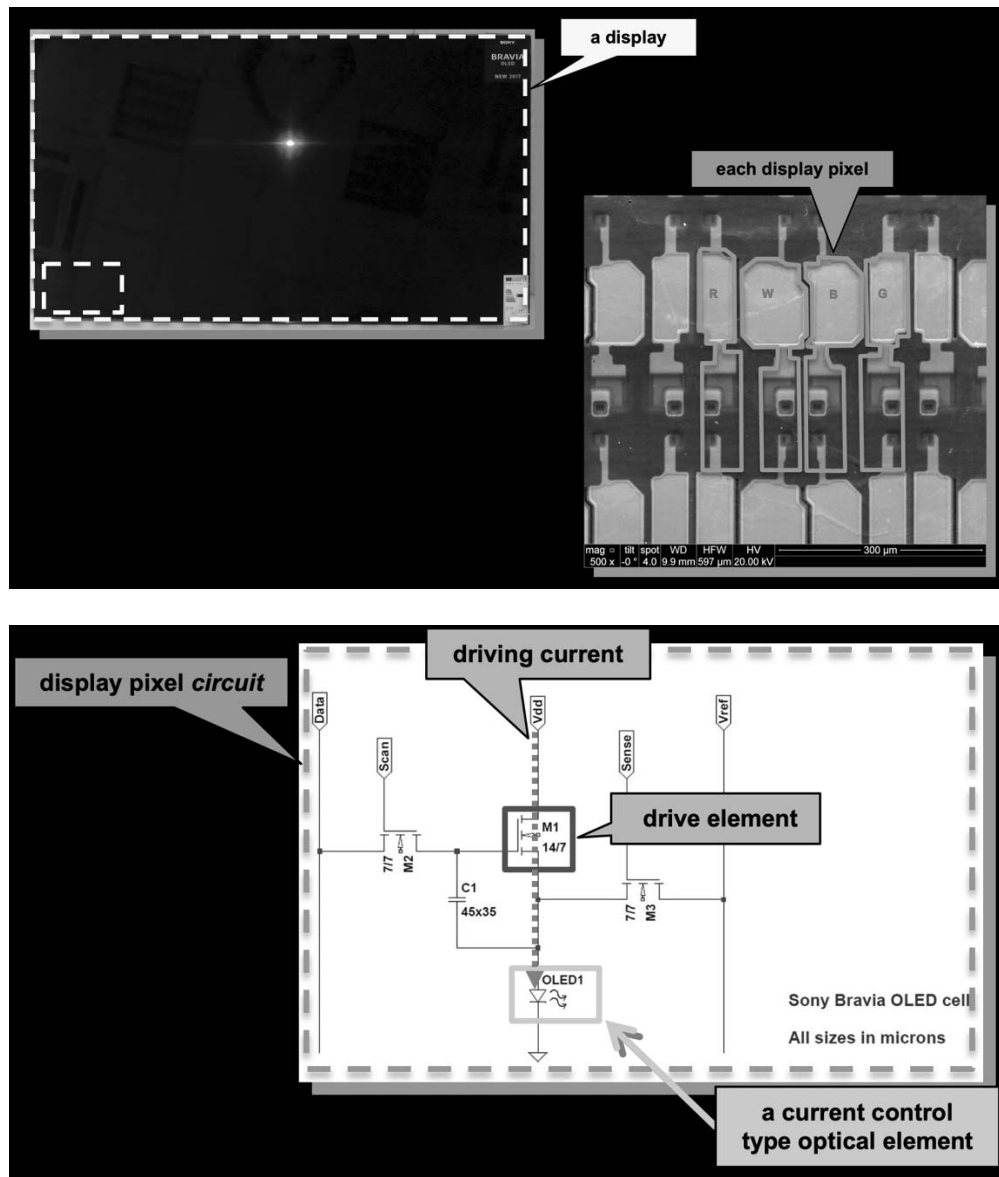
Each Defendant has additionally imported such infringing products into the United States and continues to do so.

51. By way of example only, the Sony Bravia 55A1 OLED Television infringes an exemplary claim of the '137 patent, as in the following description, which Solas provides without the benefit of information about the accused device obtained through discovery. For example, claim 10 claims a display drive apparatus as follows:

a. *A display drive apparatus which operates, in accordance with display data, a current control type optical element of each display pixel of a display, wherein each display pixel is provided with the optical element and a drive element which supplies a driving current to the optical element, the display drive apparatus comprising.*

For example, the Sony Bravia 55A1 OLED Television has a display drive apparatus that operates, in accordance with display data, a current control type optical element of each display pixel of a display, wherein each display pixel is provided with the optical element and a drive element that supplies a driving current to the optical element, as shown below.

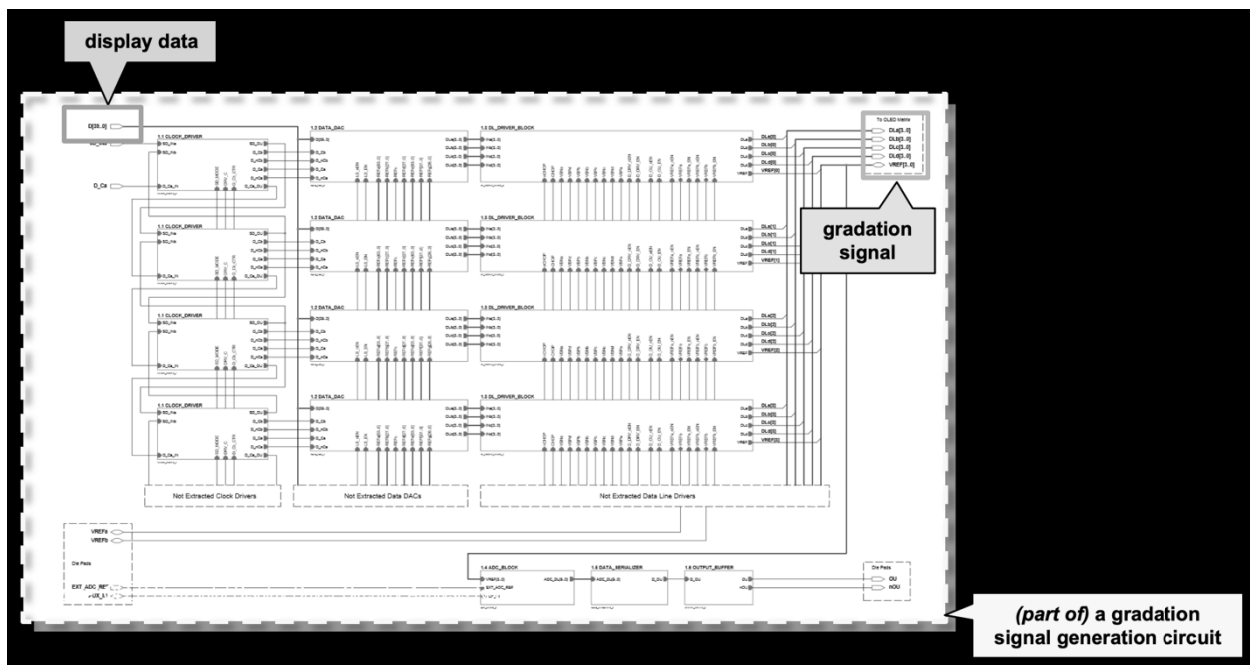
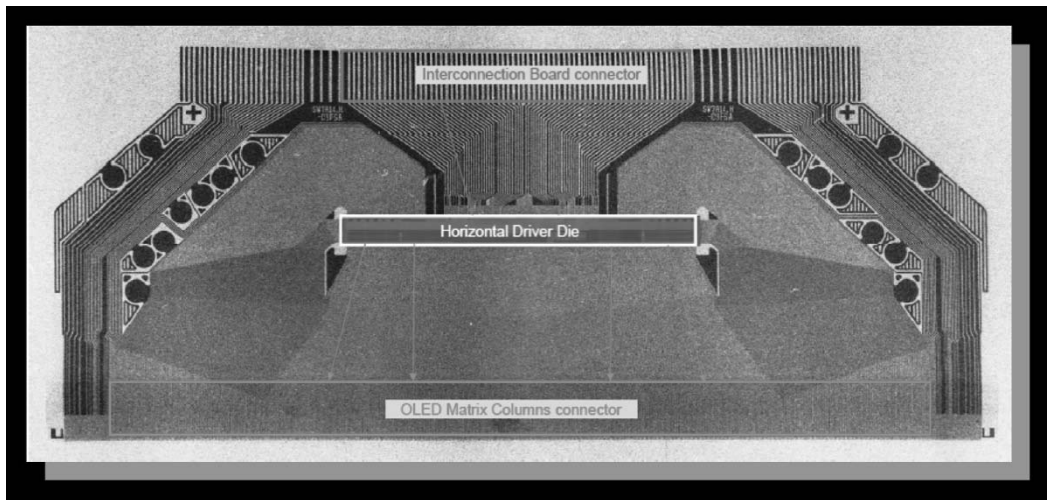


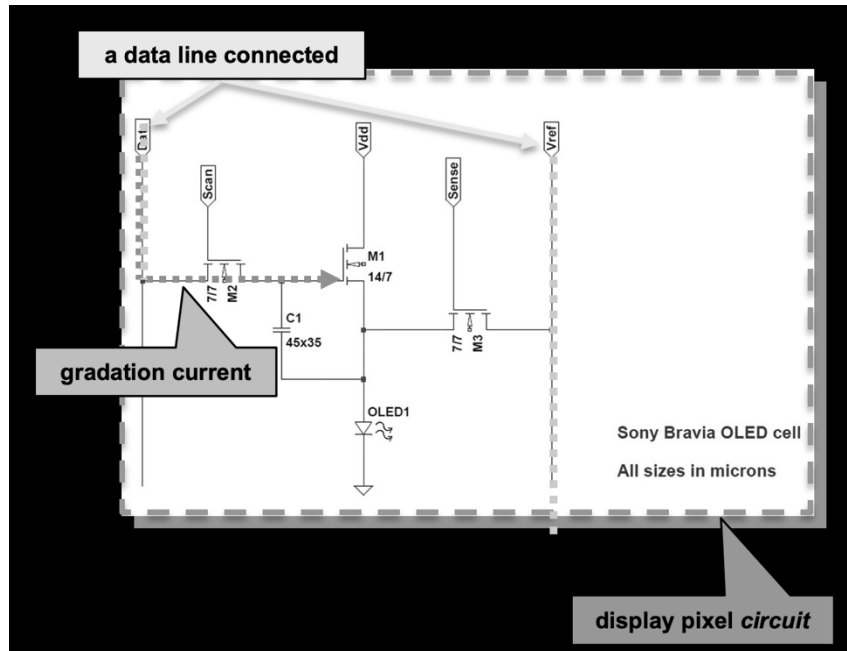


b. *a gradation signal generation circuit which generates a gradation current having a current value for allowing the optical element to perform a light emitting operation at a luminance corresponding to a luminance gradation of the display data, as a gradation signal corresponding to the luminance gradation of the display data, and supplies the gradation current to the display pixel through a data line connected to the display pixel.* For example, the display drive apparatus of the Sony Bravia 55A1 OLED Television comprises a gradation signal generation circuit that generates a gradation

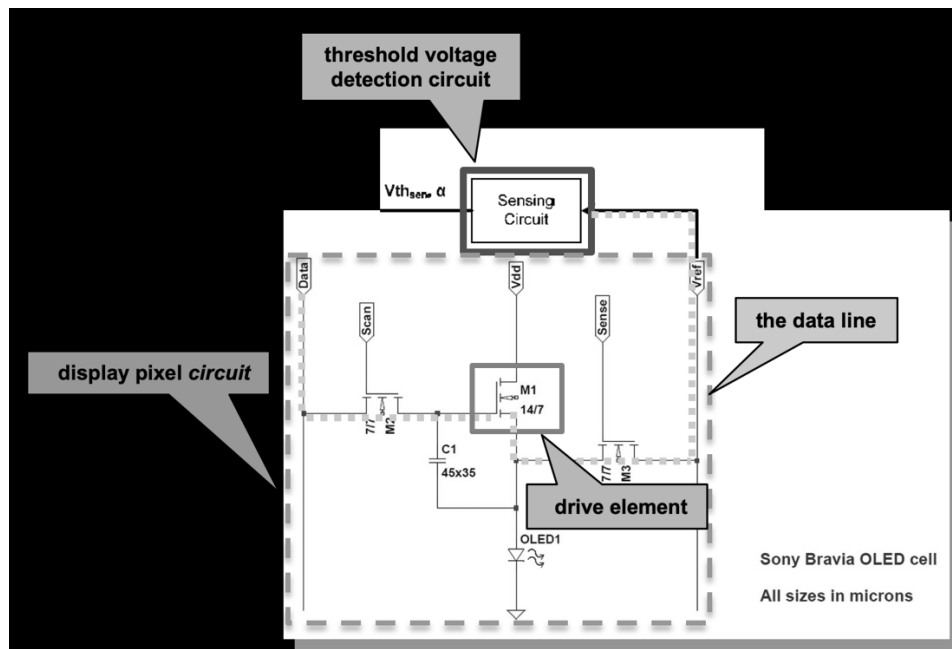


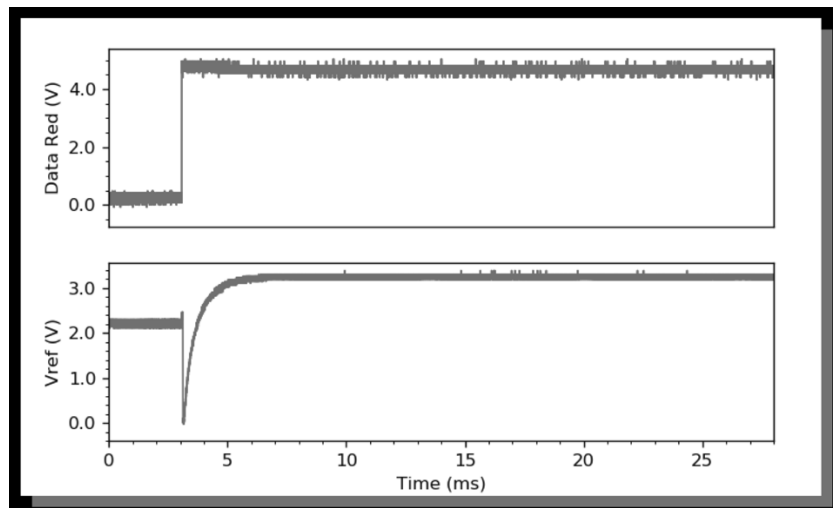
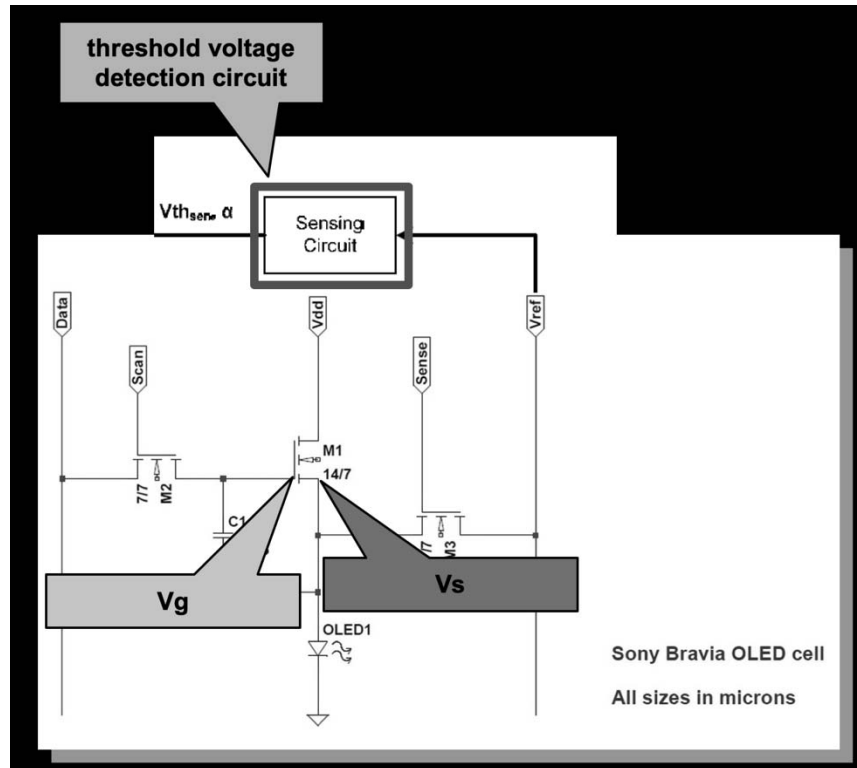
current having a current value for allowing the optical element to perform a light emitting operation at a luminance corresponding to a luminance gradation of the display data, and supplies the gradation current to the display pixel through a data line connected to the display pixel, as shown below.





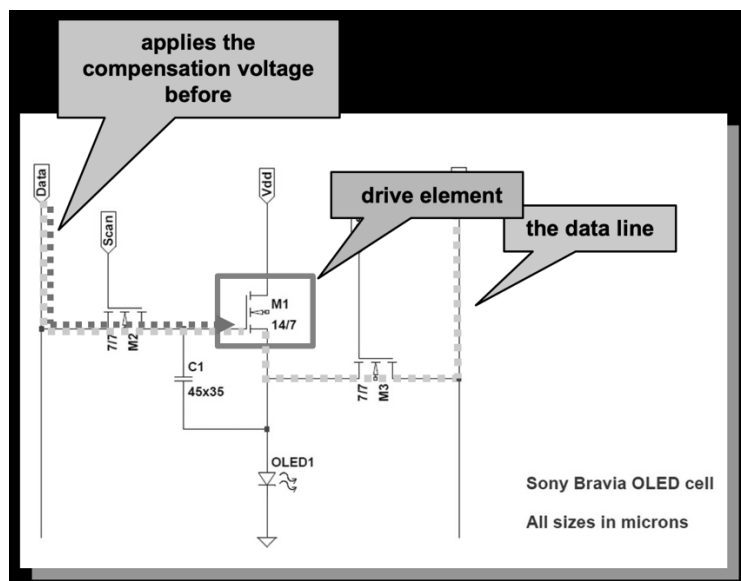
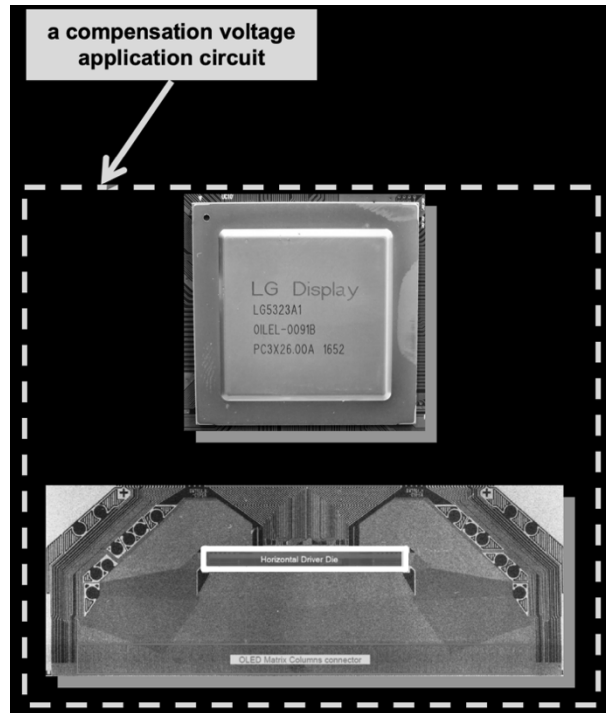
c. a threshold voltage detection circuit which detects a threshold voltage peculiar to the drive element of the display pixel through the data line. For example, the display drive apparatus of the Sony Bravia 55A1 OLED Television comprises a threshold voltage detection circuit that detects a threshold voltage peculiar to the drive element of the display pixel through the data line, as shown below.

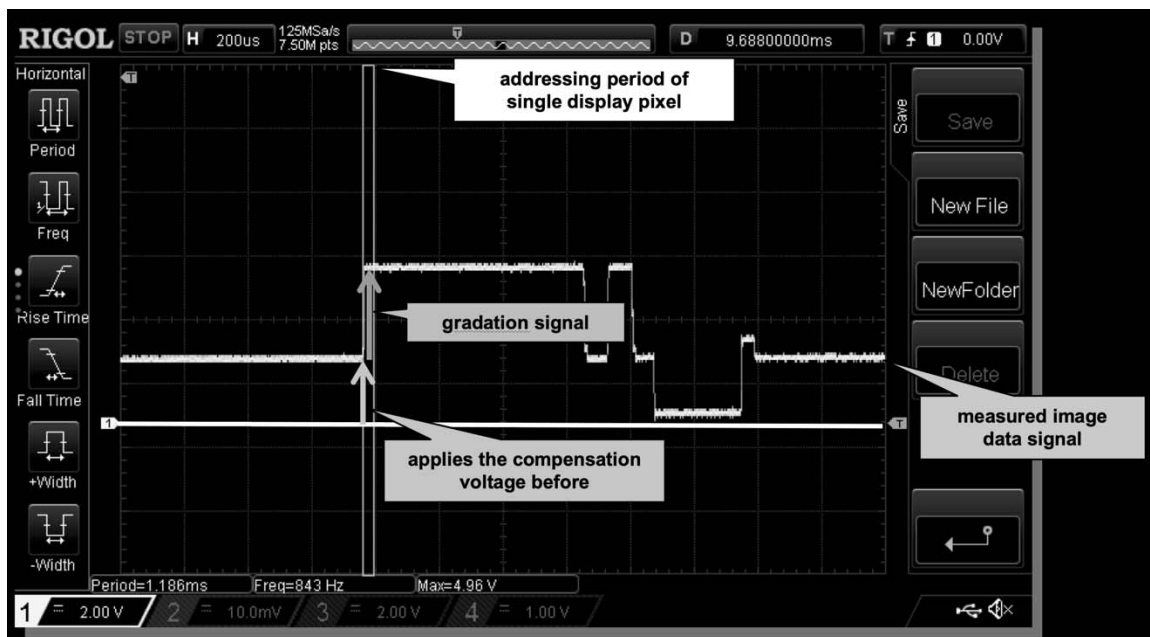
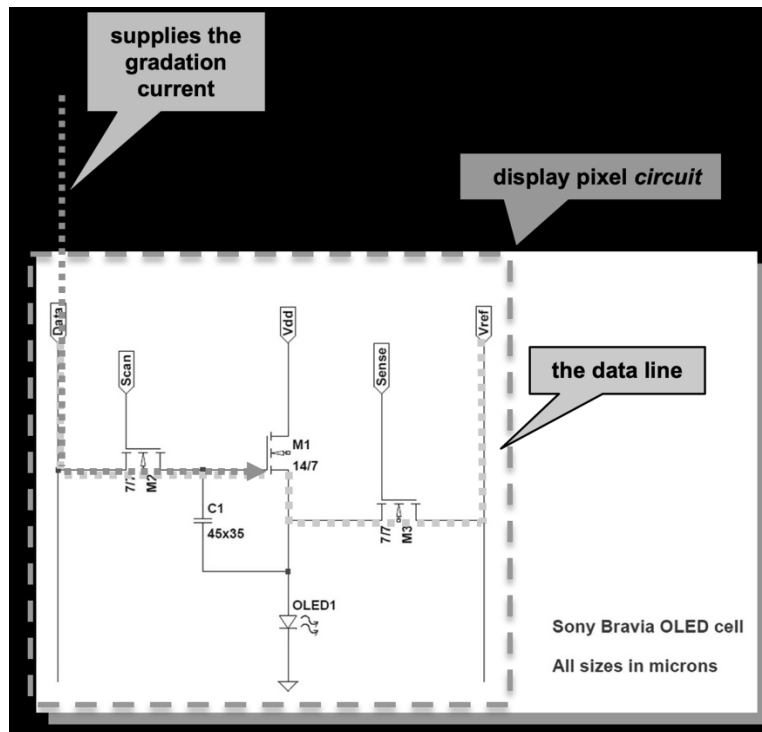




d. a compensation voltage application circuit which generates a compensation voltage for compensating for the threshold voltage of the drive element based on the threshold voltage and applies the compensation voltage to the drive element through the data line before the gradation signal generation circuit supplies the gradation current to the display pixel. For example, the display drive apparatus of the

Sony Bravia 55A1 OLED Television comprises a compensation voltage application circuit that generates a compensation voltage for compensating for the threshold voltage of the drive element based on the threshold voltage and applies the compensation voltage to the drive element through the data line before the gradation signal generation circuit supplies the gradation current to the display pixel, as shown below.





52. Defendants LG Display and LG Display America have known of the '137 patent, or have been willfully blind to the '137 patent, since at least 2016. LG Display cited to '137 patent on the face of the following patent: US10,062,327B2 (filed 5/27/2016 by LG Display) ("Data drive and organic light emitting display panel, display device, and driving method for sensing and compensating a mobility of the driving transistor") (citing US2006/0221015A1, publication of application for '137 patent).

53. Defendants LG Display and LG Display America have known how the Accused Products operate and have known, or have been willfully blind to the fact, that using, offering to sell, and selling the Accused Products within the United States, or importing the Accused Products into the United States, would constitute infringement.

54. Defendants LG Electronics and LG Electronics USA have known of the '137 patent, or have been willfully blind to the '137 patent, since at least 2016. LG Electronics has learned of the '137 patent through its investment in, and work with, related company LG Display. LG Electronics' and LG Display's engineers and product development employees work together with LG legal staff and outside counsel in the process of preparing and prosecuting patent applications. Through this process, these employees became aware of and/or were willfully blind to the '137 patent and to its relevance to the products that they design for LG Electronics and LG Display.

55. Defendants LG Electronics and LG Electronics USA have further known how the Accused Products operate and have known, or have been willfully blind to the fact, that using, offering to sell, and selling the Accused Products within the United States, or importing the Accused Products into the United States, would constitute infringement.

56. Defendants Sony Corporation and Sony Electronics have known of the '137 patent, or have been willfully blind to the '137 patent, since at least 2009. Sony cited to the '137 patent on the face of the following patent: US8345027B2 (filed 3/4/2009 by Sony Corporation) ("Image display device and driving method of image display device") (citing US2006/0221015A1, publication of application for '137 patent). Sony's engineers and product development employees work together with Sony legal staff and outside counsel in the process of preparing and prosecuting patent applications. Through this process, these employees became aware of and/or were willfully blind to the '137 patent and to its relevance to the products that they design for Sony.

57. Defendants Sony and Sony Electronics have further known how the Accused Products operate and have known, or have been willfully blind to the fact, that using, offering to sell, and selling the Accused Products within the United States, or importing the Accused Products into the United States, would constitute infringement.

58. Defendants have induced, and continue to induce, infringement of the '137 patent by actively encouraging others (including distributors and end customers) to use, offer to sell, or sell the Accused Products within the United States or to import the Accused Products into the United States. On information and belief, these acts include: providing information and instructions on the use of the Accused Products; providing information, education and instructions supporting sales by United States distributors; providing the Accused Products to United States distributors; indemnifying patent infringement within the United States; and sending representatives to the United States to demonstrate, market and sell the Accused Products.

59. Defendants have contributed to infringement of the claims of the '137 patent and continue to do so by supplying, or causing to be supplied, material parts of the invention within the United States—in particular, the circuitry designed specifically for performing the compensation functionality described in ¶¶ 10-12 and 51, including circuitry for generating the gradation current, detecting the threshold voltage of the drive element, and providing a compensating voltage signal. These components have no substantial non-infringing uses (i.e., substantial uses other than the accused compensation functionality) and are known by Defendants to be especially adapted for use in infringing the '137 patent by implementing the claimed compensation functionality. For example, upon information and belief, the image screen (e.g., the OLED display panel) of the Sony Bravia 55A1 OLED Television was supplied by Defendant LG Display and/or Defendant LG Electronics.

60. Defendants' infringement of the '137 patent has been, and continues to be, willful and egregious.

61. Solas has been damaged by Defendants' infringement and is entitled to reasonable royalty damages and enhanced damages due to Defendants' willful infringement.

#### **Damages.**

62. The foregoing paragraphs are incorporated by reference as if fully set forth herein.

63. As a result of Defendants' acts of infringement, Solas has suffered actual and consequential damages; however, Solas does not yet know the full extent of the infringement. The extent of Defendants' infringement and damages suffered by Solas cannot be ascertained except through discovery and special accounting. To the fullest extent permitted by law, Solas seeks recovery of damages at least for reasonable royalties, unjust enrichment, and benefits



received by Defendants' as a result of infringing the Patents-in-Suit. Solas further seeks any other damages to which it is entitled under law or in equity.

**Irreparable Harm to Solas.**

64. The foregoing paragraphs are incorporated by reference as if fully set forth herein.

65. Solas has been irreparably harmed by Defendants' acts of infringement. Solas will continue to be irreparably harmed unless and until Defendants' acts of infringement are enjoined by this Court. Solas has no adequate remedy at law to redress Defendants' continuing acts of infringement. The hardships that would be imposed upon Defendants are less than those faced by Solas should an injunction not issue. Furthermore, the public interest would be served by issuance of an injunction.

**Attorney's Fees.**

66. The foregoing paragraphs are incorporated by reference as if fully set forth herein.

67. Defendants' infringement of the Patents-in-Suit is exceptional, and Solas is entitled to recover reasonable and necessary attorneys' fees under applicable law.

**No marking requirement.**

68. The foregoing paragraphs are incorporated by reference as if fully set forth herein.

69. Solas is not under an obligation to mark any products with the patent numbers of any of the Patents-in-Suit in accordance with 35 U.S.C. § 287. By way of example, Solas and the licensees of the Patents-in-Suit, do not and have not used, made, offered for sale, or sold any patented article in the United States and do not and have not imported any patented article into the United States.

**Jury demand.**

70. Solas demands trial by jury of all issues.

**Relief requested.**

Solas prays for the following relief:

- A. A judgment in favor of Solas that Defendants have infringed the Patents-in-Suit and that the patent is valid, enforceable, and patent-eligible;
- B. A judgment and order requiring Defendants to pay Solas damages in an amount adequate to compensate Solas for Defendants' infringement, but in no event less than a reasonable royalty under 35 U.S.C. § 284, including supplemental damages for any continuing post-verdict infringement up until entry of judgment, as well as costs, expenses, and pre- and post-judgment interest for their infringement of the Patents-in-Suit, as provided under 35 U.S.C. § 284;
- C. A judgment that Defendants have willfully infringed the Patents-in-Suit and that Solas is entitled to enhanced damages as a result of such willful infringement;
- D. A permanent injunction prohibiting Defendants from further acts of infringement of the Patents-in-Suit;
- E. A judgment and order requiring Defendants provide an accounting and to pay supplemental damages to Solas, including without limitation, pre-judgment and post-judgment interest;
- F. A finding that this case is exceptional under 35 U.S.C. § 285, at minimum due to Defendants' willful infringement, and an award of Solas' reasonable attorney's fees and costs;
- G. A judgment and order requiring Defendants to pay Solas's costs of this action (including all disbursements); and
- H. Any and all other relief to which Solas may be entitled.

Dated: August 27, 2020

Respectfully submitted,

/s/ Reza Mirzaie

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